

A HUMIDIFYING GAS INDUCTION OR SUPPLY SYSTEM

Abstract of the Disclosure

Water vapor is introduced into an inlet air stream (16) of an engine (12), for example, by a pervaporation process through a non-porous hydrophilic membrane (18). A water reservoir (20), which can contain contaminated water, provides a vapor pressure gradient across the hydrophilic membrane (18) into the inlet air stream (16), while the rate of delivery of the water vapor to a cylinder (38-40) is self-regulated by the rate of flow of air across the membrane. The hydrophilic membrane (18) therefore also filters the water from the water reservoir (20) to an extent that pure water vapor is provided to the air inlet stream (16). Delivery of water vapor can nevertheless be controlled using a hood (26) that slides over the hydrophilic membrane to limit its exposed surface area. Alternatively, water vapor is introduced into one or more of the gas streams of a fuel cell by separating the gas stream from the wet exhaust gas stream by a hydrophilic membrane such that moisture passes across the membrane to moisten the gas stream and thereby prevent drying out of the proton exchange membrane.